

Submerged

An Honors Thesis (ARCH 401)

by

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Thesis Advisor
George Elvin

A handwritten signature in black ink, appearing to read "Geo Elvin". The signature is fluid and cursive, with the first name "Geo" and last name "Elvin" clearly distinguishable.

Ball State University
Muncie, Indiana

December 2012

Expected Date of Graduation

May 2013

Undergrad
Thesis
LD
2489
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Abstract

Castle Pinckney was once a great fortress, playing an important role in the national security of the United States. However, today it has fallen to decaying ruins on a tidal salt marsh submerged by water in the harbor of Charleston. As part of the school and national design competition, I analyzed the situation to create an architectural design response that would restore the castle and marsh to a useable and purposeful part of the community. The design engages visitors through education and experience, while incorporating the components of castle, cabin, and pavilion, and taking advantage of the unique environmental context.

Acknowledgements

I would like to thank Dr. George Elvin for advising me through this thesis and design project. His help and critiques contributed not only to the project development, but also to my personal growth in architecture studio education along the way.

Author's Statement

The purpose of this thesis project was to solve a real-life challenge: how to turn a vacant tidal salt marsh and decaying castle off the coast of Charleston, South Carolina, into a useable and purposeful part of the community, while responding to site's unique environmental conditions. The thesis centers around an individual eleven-week architecture design project as part of the Ball State fourth-year architecture design studio competition and the Association of Collegiate Schools of Architecture National Student Ideas Competition. These competitions asked each student to rethink the tidal marsh of Shute's Folly and Castle Pinckney on the marsh to create a proposal of their vision for the two, while graphically representing their ideas for its future.

My thesis project began by considering Shute's Folly in the context of the community of Charleston, and then outlining how I saw the marsh and castle as best used by the community. Although Charleston is a very well-preserved historical city, including much tourism to Fort Sumter, it currently lacks an environmental education center related to its unique environmental context: the tidal salt marsh. In order to revitalize Shute's Folly and tie into the community needs, I decided that the purpose of the project needed to bring people out to the marsh. The method of doing this would be education, both historical and environmental, to combine with the existing framework of the historic city and take advantage of the opportunity to fill a community need. To further attract visitors to the island, I also decided the design would need to provide a unique experience, especially incorporating the tidal movement, which is the biggest dynamic element of the site and also poses a challenge to moving around the site. Additionally, I wanted to minimize the built elements on the marsh, to maintain the environment that visitors would come to see. This meant that any built structures should be raised above the ground or positioned off the island, and that their size should not dominate the harbor.

My proposed design "Submerged," offers a solution to reawaken Shute's Folly and Castle Pinckney, reestablishing them as a viable part of Charleston. While visitors learn about the environment and history, "Submerged" literally takes this concept into the design and experience of three coordinating main components: castle, cabin, and pavilion. First, the ruins of Castle Pinckney will be fully restored to function as a piece of living history, allowing visitors to tour and view reenactors. This positions the castle to become part of a historical tour en route to Fort Sumter. The construction will reflect its 1811 role in national security, yet sit high enough on its original plinth to protect it from storms.

In order to orient visitors once they arrive by ferry at Shute's Folly, a Welcome Pavilion was positioned near the dock, which introduces the environmental and historical information of the site and castle. The pavilion not only submerges visitors in the initial site experience as an anchored gateway, but it also becomes submerged itself by water at high tide. This directly addresses the idea of creating a unique and interactive experience to engage visitors. An exhibition space showcases displays and artifacts, yet is designed to be open and angled to let in water; like the island, it reveals new content when the tide ebbs. Designed for minimal impact, the pavilion is entirely passive (operating without the need for electricity), using form to accommodate all functions, including framing views, channeling wind, using water and concrete for

cooling (a heat sink), protecting from storms with integrated doors, and utilizing a living machine (natural plant system) to break down restroom wastes.

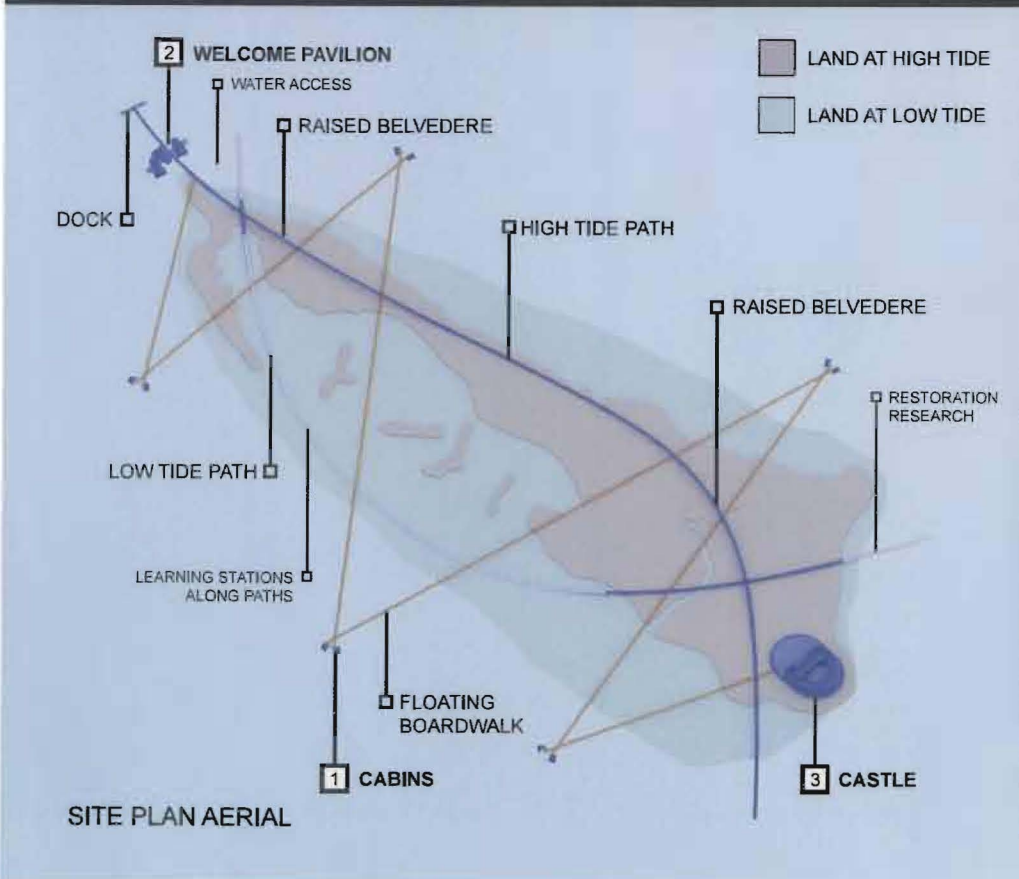
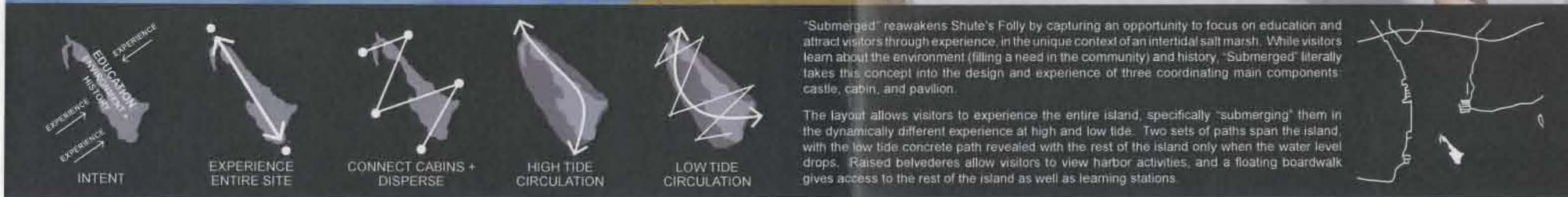
The site layout allows visitors to observe the entire island, specifically “submerging” them in the dynamically different experience at high and low tide. With the dock and castle at opposite ends, a concrete high tide path spans between, with occasional raised belvederes to view harbor activities. A secondary low tide path is revealed with the rest of the island only when the water level drops, extending outward to engage visitors with island preservation efforts. Along this, visitors can view learning stations, access the water, or walk on a floating boardwalk across the rest of the marsh, both of which pass under the high tide path to differentiate the tidal experience.

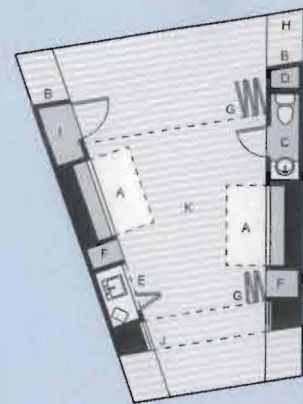
As a third component, visitors can complete their experience by staying the night on Shute’s Folly. Cabins provide for lodging essentials and can accommodate families, school groups, reenactors, or researchers. Secluded along the perimeter to allow privacy, these areas are connected by boardwalk. The cabins’ interaction with water contrasts to that of the Welcome Pavilion, as they adapt to the tides by floating with the boardwalk. When storms come, the cabins can be detached and relocated behind the Welcome Pavilion for protection. While they are designed to appear simplistic, maximizing wind flow, views, shade, and environmental connection, the functions are located in the side walls, including murphy (fold-down) bunk beds, a small restroom, kitchenette, shelves, storm doors, and a mechanical space. Thin-film solar panels generate any needed power, and all wastes are collected and pumped into the living machine.

Overall, I think the design project accomplished a comprehensive solution to my original challenge of providing a useful proposal for the marsh while reconnecting it to Charleston. The final products of the design, as dictated by the competition, were a set of graphics as part of four 20” x 20” display boards that conveyed the entire design intent, as well as a 20” x 30” physical model of the Welcome Pavilion. On the way to creating the final product, my studio professor and advisor held desk critiques of my process and work, and our class occasionally presented our ideas in reviews, including a final review where we presented to local architects. These critiques and reviews informed my design process, as well as provided me with new ways to consider a problem. Looking back, this project has helped me gain a greater understanding of how to set up my own program, especially in how to create specific intentions and goals, then address them through means of design. It has also developed my abilities in site planning, as well as how to think about both the broad objectives and the details needed to accomplish them.

Works Cited

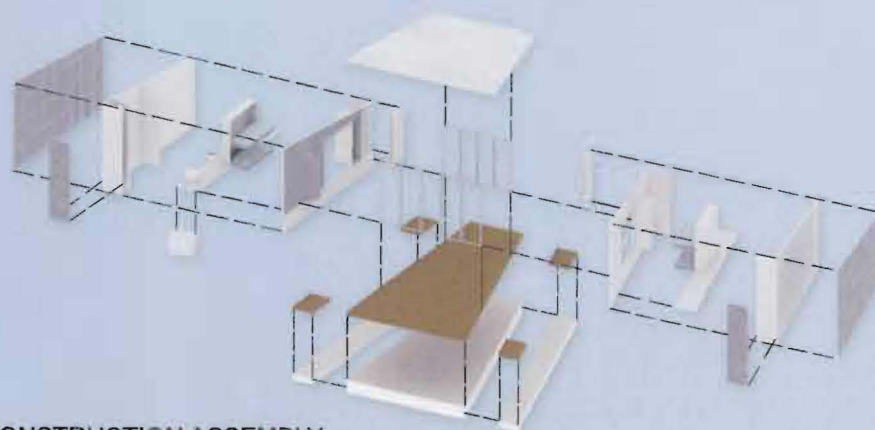
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CABIN FLOOR PLAN

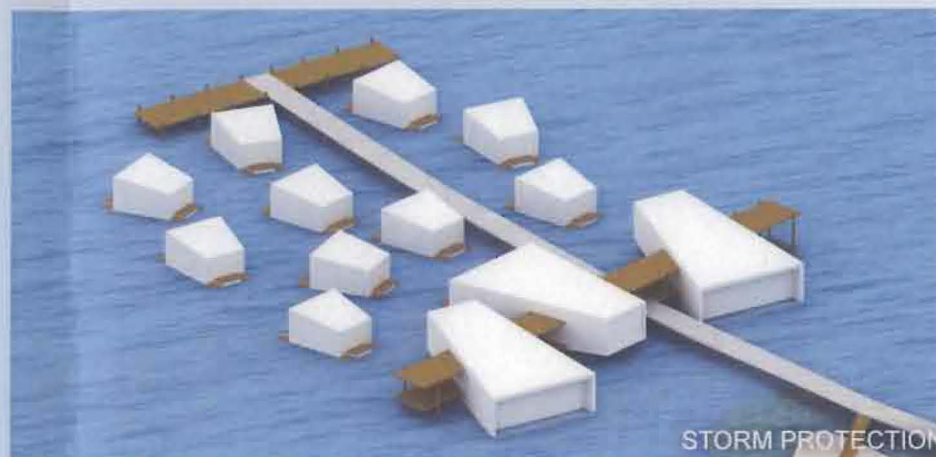
- A MURPHY BUNK BED
- B THIN FILM SOLAR PANELS
- C RESTROOM
- D SEWAGE TANK (PUMP TO LIVING MACHINE)
- E KITCHENETTE
- F SHELVES
- G NANAWALL DOOR AND SCREEN
- H STEP FOR WATER ACCESS (TYP.)
- I MECHANICAL CLOSET AND DESALINATION
- J HURRICANE RESISTANT DOORS
- K COMPOSITE WOOD FLOOR
- L COMPOSITE BOARDWALK



CONSTRUCTION ASSEMBLY



CABIN INTERIOR



STORM PROTECTION



1



FORM FROM HARBOR



FRAMED VIEWS + VENTILATION



FLOAT + MOVE



SECLUSION / PRIVACY



VIEWS OF CITY

To complement the focus on education, visitors can complete their experience by staying the night on Shute's Folly. Cabins provide for lodging essentials and can accommodate families, school groups, reenactors, or researchers. Secluded, yet connected by the boardwalk, the cabins float in order to be detached and relocated during storms.

Designed to appear simplistic, they maximize on wind flow, views, and environmental connection, with the functions located in the side walls, including murphy bunk beds, a small restroom, kitchenette, shelves, storm doors, and mechanical space. Thin-film solar panels generate any needed power, and all wastes are collected and pumped into the living machine.



CABINS

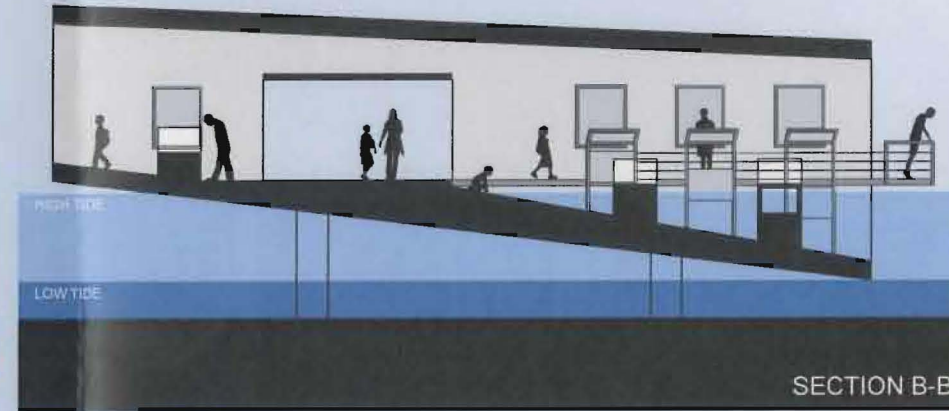
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WELCOME PAVILION PLAN

- A "SUBMERGED" EXHIBITION SPACE
- B ISLAND INFORMATION
- C LIVING MACHINE WASTE MANAGEMENT AND DESALINATION
- D HURRICANE RESISTANT DOORS
- E HIGH TIDE PATH
- F RESTROOM
- G STORAGE
- H BELVEDERE
- I OFFICE
- J TIERED ACCESS TO TIDE
- K COMPOSITE BOARDWALK



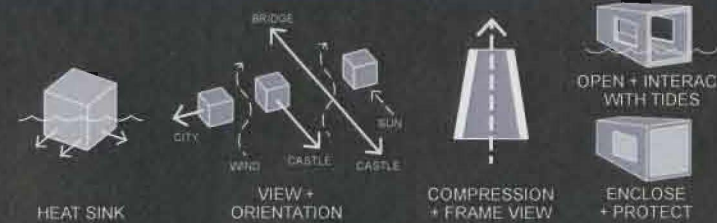
"SUBMERGED" EXHIBITION



SECTION B-B



2

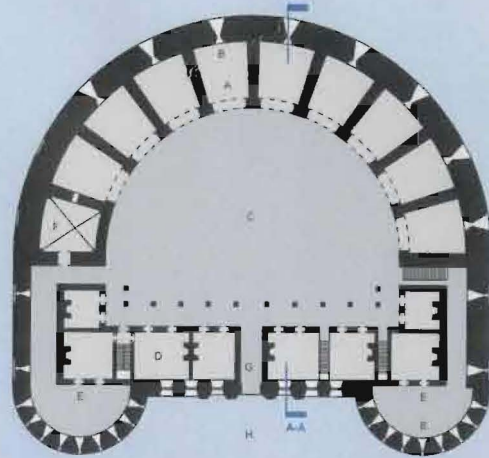


Upon arriving at Shute's Folly, visitors pass through the Welcome Pavilion and are introduced to environmental and historical information about the site and role of the castle. The pavilion not only submerges visitors in the initial site experience as an anchored gateway, but it also becomes submerged itself by water at high tide, allowing visitors to interact. An exhibition space showcases displays and artifacts, yet is designed to be open and angled to let in water, like the island, it reveals new content when the tide ebbs.

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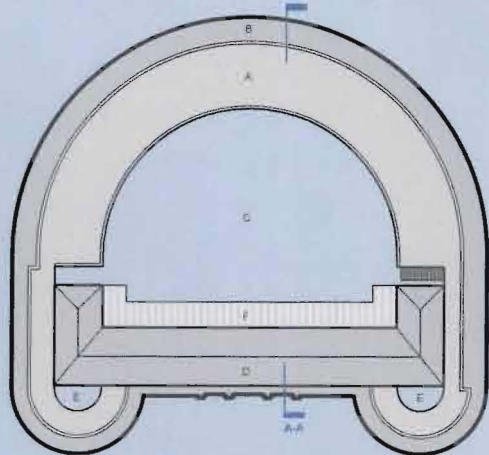
PAVILION



CASTLE FLOOR PLAN

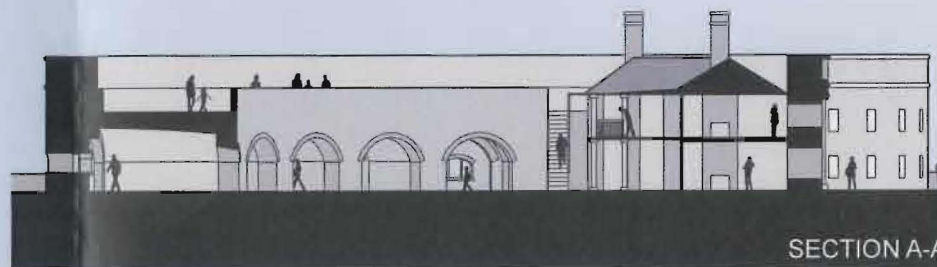
GROUND FLOOR

- A CANNON STATIONS (TYP.)
- B EMBRASURE (TYP.)
- C OPEN COURT
- D QUARTERS
- E CISTERN
- F AMUNITION
- G ENTRY
- H PLINTH WALKWAY



SECOND FLOOR TERRACE

- A UPPER WALKWAY
- B OVERHEAD CANNONS
- C OPEN COURT BELOW
- D QUARTERS
- E CISTERN
- F DECK



3



RESTORE:
LIVING HISTORY



MODERN
HISTORIC
BRIDGE
FORM + TRANSITION



FRAMED /
CHANGING VIEWS

The ruins of Castle Pickney will be fully restored to function as a piece of living history, allowing visitors to tour and view reenactors. This also allows the castle to become part of a historical tour en route to Fort Sumpter. The construction will reflect its 1811 role in national security, yet sit high enough on its original plinth to protect it from storms.

The design language on the island defines the new from the old, while also separating the historic entered via a boardwalk bridge. The main pathway curves to allow views of the castle from multiple angles when approaching. When visitors finish touring the castle at high tide, they then have the option to return to the Welcome Pavilion using the low tide path, experiencing a new environment on the site and completing their "submerged" experience.



CASTLE

